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[10744/4200]

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES

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In re Application of: : Examiner: Mark O. Budd
: :
Johannes-Joerg RUEGER et al. : :
: :
For: COMPENSATION OF BATCH : :
VARIATION IN THE TRAVEL DUE : :
TO VARIATIONS IN THE LAYER : :
THICKNESS OR NUMBER OF LAYERS : :
IN MULTI-LAYER PIEZOELECTRIC : :
ELEMENTS : :
: :
Filed: April 2, 2001 : :
: Art Unit 2834
: :
Serial No.: 09/824,193 : :
: :
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REPLY BRIEF PURSUANT TO 37 C.F.R. § 1.193(b)

S I R:

This Reply Brief is in response to the Examiner's
Answer dated December 22, 2003. Although not required, this
Reply Brief is filed in triplicate as a courtesy to the Board
and to the United States Patent and Trademark Office.

For the reasons more fully set forth in the Appeal
Brief and those set forth below, it is respectfully submitted
that the final rejections of claims 1 to 34 should be reversed
and that claims 1 to 34 should be allowed.

GROUPING OF CLAIMS

The Examiner's Answer states at page 2 that "[t]he rejection of claims stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof." This statement is not understood. The Appeal Brief plainly includes arguments addressing each of the five (5) grounds of rejection, i.e., each of the five (5) issues. Each ground of rejection is, of course, independent of every other ground of rejection, and any contention that all rejections stand or fall together is unsupported by the Rules, which merely require that "[f]or each ground of rejection . . . which applies to a group of two or more claims, the Board shall select a single claim from the group and shall decide the appeal as to the ground of rejection on the basis of that claim alone unless a statement is included that the claims of the grp do not stand or fall together and . . . appellant explains why the claims of the group are believed to be separately patentably." 37 C.F.R. § 1.192(c)(7) (emphasis added). Accordingly, to the extent that the statement that "[t]he rejection of claims stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof" was intended to mean that all rejections stand or fall together, this position is plainly untenable.

Furthermore, at pages 8 to 9, the Appeal Brief plainly includes "a statement . . . that the claims of the group do not stand or fall together" as required under 37 C.F.R. § 1.192(c)(7).

Furthermore, for each issue identified in the Appeal Brief as including groups of claims that do not stand or fall together, the Appeal Brief plainly includes arguments addressing each such groups of claims. It is respectfully submitted that any reading of the "Argument" section of the Appeal Brief plainly satisfies the requirement of 37 C.F.R. § 1.192(c)(7) that "appellant explain[] why the claims of the

group are believed to be separately patentable", and it is respectfully submitted that the claims should be reviewed as grouped.

Based on the statements contained on page 3 of the Examiner's Answer, it is understood that the final rejection of claims 8 to 17 under 35 U.S.C. § 112, second paragraph, i.e., Issue A, has been withdrawn, and that the final rejection of claims 1, 3, 4, 18, 20, 21 and 25 under 35 U.S.C. 102(b), i.e., Issue B, has been withdrawn.

ARGUMENTS

I. Rejection of Claims 1, 2, 8, 9, 18, 19, 25, and 26 Under 35 U.S.C. § 102(b)

Claims 1, 2, 8, 9, 18, 19, 25, and 26 stand finally rejected under 35 U.S.C. § 102(b) as anticipated by U. S. Patent No. 4,593,658 ("Moloney"). It is respectfully submitted that the rejection should be reversed for the following reasons.

The Examiner's Answer states at page 3, for the first time during prosecution, that Moloney "inherently compensates for changes in the thickness of any and all piezo elements in the stack." No such allegations of inherency have been made in any of the Office Actions to date.

To anticipate a claim, "[t]he identical invention must be shown in as complete detail as is contained in the . . . claim," Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989), and the prior art must describe the elements arranged as required by the claims, In re Bond, 910 F.2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990).

Moloney states that Figure 3 includes a "piezo-electric feedback loop control circuit." Col. 3, lines 26 to 27. Of this feedback, Moloney merely states, "the circuit provides for a loop control system so that the movement transmitted by the piezoelectric device(s) to the valve is sensed and any deviation from the correct movement is

corrected by means of the control circuit." Col. 3, lines 30 to 35.

It is respectfully submitted that Moloney does not present each and every element of claims 1 and 18 in as complete detail as is contained in claims 1 and 18. For example, Moloney states that deviation from correct movement is corrected. However, claim 1 includes the detail that deviations caused by variations in the piezoelectric element's layer thickness or the number of layers are compensated for. Claim 18 includes analogous limitations. This additional detail is important because it distinguishes between the types of changes caused by age of the piezoelectric device, from the deviations caused by manufacturing variations. Moloney appears to be describing the former -- that is, changes caused by age of the piezoelectric device -- because there is no inherent correct positioning of a piezoelectric device that is established during its manufacture. It appears that the positioning deviations would arise after the piezoelectric device has been placed in a particular position and operated for a period of time, such that changes in current positioning relative to its initial positioning may be observed. Therefore, the deviation of correct positioning stated in Moloney is not the same as the deviations caused by variations in the piezoelectric element's layer thickness and/or the number of layers, as recited in claims 1 and 18.

As stated above, Moloney merely states that deviation from correct movement is corrected. However, claims 8 and 25 include the limitation that a definition is made, prior to charging, of certain values as a function of batch variation. Therefore, the deviation of correct positioning stated in Moloney is not the same as the deviations caused by the batch variation, as recited in claims 8 and 25.

Furthermore, Moloney does not disclose, or even suggest, that a definition is made prior to charging, as recited in claims 8 and 25.

As regards the new allegations of inherency, "[i]n relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." Ex parte Levy, 17 U.S.P.Q.2d 1461, 1464 (emphasis in original). Neither the Examiner's Answer nor the Office Actions to date provide any such indication. Of course, "[i]nherency . . . may not be established by probabilities or possibilities" and that "[t]he mere fact that a certain thing may result from a given set of circumstances is not sufficient." Ex parte Skinner, 2 U.S.P.Q.2d 1788, 1789 (Bd. Pat. App. & Inter. 1986). It is respectfully submitted that there is nothing in the record to support the contention that Moloney "inherently compensates for changes inthe [sic] thickness of any and all piezo elements in the stack" as now, for the first time, alleged.

In summary, is respectfully submitted that Moloney does not disclose, or even suggest, all of the features of claims 1 and 18 and, therefore, does not anticipate claims 1 and 18. Furthermore, is respectfully submitted that Moloney does not disclose all of the features of claims 8 and 25 and therefore does not anticipate claims 8 and 25.

As for claims 2 and 19, claim 2 depends from claim 1 and therefore includes all of the features of claim 1, and claim 19 depends from claim 18 and therefore includes all of the features of claim 18. It is, therefore, respectfully submitted that claim 2 is not anticipated by Moloney for at least the same reasons given above in support of claim 1 and that claim 19 is not anticipated by Moloney for at least the same reasons given above in support of claim 18. As for claim 9, claim 9 depends from claim 8 and therefore includes all of the features of claim 8. It is, therefore, respectfully submitted that claim 9 is not anticipated by Moloney for at least the same reasons given above in support of claim 8. As for claim 26, claim 26 depends from claim 25 and therefore includes all of the features of claim 25. It is, therefore,

respectfully submitted that claim 26 is not anticipated by Moloney for at least the same reasons given above in support of claim 25.

In view of all of the foregoing, it is respectfully requested that the final rejection of claims 1, 2, 8, 9, 18, 19, 25, and 26 be reversed.

II. Rejection of Claims 3 to 7, 10 to 14, 20 to 24, and 27 to 31 Under 35 U.S.C. § 103(a)

The Examiner's Answer states at page 3 that "Claims 3-7, 10-14, 20-24, and 27-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moloney in view of Takada et al. or Jaenker" (emphasis added). However, in the Final Office Action, only claims 3 to 7, 10 to 14, 20 to 24, 30 and 31 were rejected under 35 U.S.C. § 103(a) based on the combination of Moloney and Takada et al. or Jaenker. An Examiner's Answer, of course, "must not include a new ground of rejection." 37 C.F.R. § 1.193(a)(2). Appellants proceed in replying to the statements contained in the Examiner's Answer to the extent they relate to claims 3 to 7, 10 to 14, 20 to 24, 30 and 31, since claims 27 to 29 have not previously been rejected under this ground.

In rejecting a claim under 35 U.S.C. § 103(a), the Examiner bears the initial burden of presenting a prima facie case of obviousness. In re Rijckaert, 9 F.3d 1531, 1532, 28 U.S.P.Q.2d 1955, 1956 (Fed. Cir. 1993). To establish prima facie obviousness, three criteria must be satisfied. First, there must be some suggestion or motivation to modify or combine reference teachings. In re Fine, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). This teaching or suggestion to make the claimed combination must be found in the prior art and not based on the application disclosure. In re Vaeck, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). Second, there must be a reasonable expectation of success. In re Merck & Co., Inc., 800 F.2d 1091, 231 U.S.P.Q. 375 (Fed. Cir. 1986). Third, the prior art reference(s) must teach or suggest all of

the claim limitations. In re Royka, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974).

The Examiner's Answer presents new arguments regarding this rejection, stating at page 4 that "[i]t would have been obvious to one of ordinary skill in the art [sic] to select from among known compensation techniques and thus to use voltage factors in the actuator Moloney."

Moloney does not disclose, or even suggest, all of the limitations of claims 1 and 18, such as compensating for deviations caused by variations in the piezoelectric element's layer thickness or the number of layers. Additionally, Moloney does not disclose, or even suggest, all of the limitations of claims 8 and 25, such as that a definition is made, prior to charging, of certain values as a function of batch variation in the travel of the piezoelectric element. Therefore, it is respectfully submitted that claim 3 is patentable over Moloney for at least the same reasons given above in with respect to claim 1, claim 10 is patentable over Moloney for at least the same reasons given above in with respect to claim 8, claim 20 is patentable over Moloney for at least the same reasons given above in with respect to claim 18, and claim 27 is patentable over Moloney for at least the same reasons given above in with respect to claim 25.

It is not even alleged that Takada et al. or Jaenker disclose the above features of the claims that are not disclosed by Moloney, and it is respectfully submitted that neither Takada et al. nor Jaenker discloses, or even suggests, the above features of the claims that are not disclosed by Moloney.

Furthermore, claims 3, 10, 20, and 27 further recite that the control unit determines the activation voltage value and the activation charge values respectively as a function of the piezoelectric element's normal voltage, normal charge and a correction factor.

The Examiner's Answer contends that "Takada [et al.] and Jaenker teach measuring the relationship between voltage and displacement and thus obtaining a correction factor," but

provides no support for this assertion. However, even though Appellants do not necessarily agree with this assertion, even if it were true, it still would not provide a basis for rejection of the claims. This assertion only states that the references purportedly disclose that a correction factor is derived from a relationship between voltage and displacement. However, claims 3, 10, 20, and 27 recite that three characteristics of the piezoelectric element are taken into account in determining the activation values: the piezoelectric element's normal voltage, normal charge and a correction factor. The correction factor of the present claims is not based on a simple relationship between voltage and displacement. The correction factor of the present claims takes into account features including the number of layers of the multi-layer piezoelectric element, the voltage applied before any correction, and the lifting distance as measured directly after manufacturing of the piezoelectric element. Specification, page 27, line 32 to page 28, line 3. It is noted that these are measurements representing "variations in the piezoelectric element's layer thickness or the number of layers" (as recited in claims 1, 8, and 18, from which claims 3, 10, and 20 respectively depend) and "batch variations" (as recited in claim 25, from which claim 27 depends), which are used in deriving the activation values which compensate for the deviations.

Therefore, even if the Office Actions' assertion is correct, and Appellants do not necessarily agree that it is, the combination of Moloney and Takada et al. or Jaenker still does not disclose all of the features of the claims. None the Office Action of March 27, 2002, the Final Office Action, and the Examiner's Answer even allege that Takada et al. or Jaenker discloses using a normal voltage, a normal charge, and a correction factor in determining activation values, as recited in claims 3, 10, 20, and 27, and it is respectfully submitted that these references do not disclose, or even suggest, the above features of claims 3, 10, 20, and 27.

Therefore, it is respectfully submitted that the combination of Moloney and Takada et al. or Jaenker does not disclose, or even suggest, that a normal voltage, a normal charge, and a correction factor are used in determining activation values, as recited in claims 3, 10, 20, and 27.

Accordingly, it is respectfully submitted that the combination of Moloney and Takada et al. or Jaenker does not disclose, or even suggest, all of the limitations of claims 3, 10, 20, and 27. It is, therefore, respectfully submitted that the combination of Moloney and Takada et al. or Jaenker does not render obvious claims 3, 10, 20, and 27, and it is respectfully requested that the final rejection of these claims be reversed.

Claims 4 to 7 depend from claim 3 and ultimately depend from claim 1 and therefore include all of the limitations of claims 1 and 3, claims 11 to 14 depend from claim 10 and ultimately depend from claim 8 and therefore include all of the limitations of claims 8 and 10, claims 21 to 24 depend from claim 20 and ultimately depend from claim 18 and therefore include all of the limitations of claims 18 and 20, and claims 28 to 31 depend from claim 27 and ultimately from claim 25 and therefore include all of the limitations of claims 25 and 27.

Therefore, it is respectfully submitted that claims 4 to 7 are patentable over the combination of Moloney and Takada et al. or Jaenker for at least the same reasons given above in with respect to claims 1 and 3, that claims 11 to 14 are patentable over the combination of Moloney and Takada et al. or Jaenker for at least the same reasons given above in with respect to claims 8 and 10, claims 21 to 24 are patentable over the combination of Moloney and Takada et al. or Jaenker for at least the same reasons given above in with respect to claims 18 and 20, and that claims 28 to 31 are patentable over the combination of Moloney and Takada et al. or Jaenker for at least the same reasons given above in with respect to claims 25 and 27.

Furthermore, claims 4, 11, 21, and 28 further recite that the correction factor is a function of a piezoelectric element's normal travel distance and the piezoelectric element's respective actual travel distance. As more fully set forth above, the Office Action of March 27, 2002 alleges at page 3 that Takada et al. and Jaenker disclose "measuring the relationship between voltage and displacement and thus obtaining a correction factor." None the Office Action of March 27, 2002, the Final Office Action, and the Examiner's Answer even allege that the combination of Moloney and Takada et al. or Jaenker discloses a correction factor that is a function of a piezoelectric element's normal travel distance and the piezoelectric element's respective actual travel distance, as recited in claims 4, 11, 21, and 28, and it is respectfully submitted that these features of claims 4, 11, 21, and 28 are not disclosed, or even suggested, by the combination of Moloney and Takada et al. or Jaenker.

Claims 5, 12, 22 and 29 depend respectively from claims 4, 11, 21, and 28 and are therefore patentable over the combination of Moloney and Takada et al. or Jaenker for at least the same reasons given above in support of the patentability of claims 4, 11, 21 and 28.

Additionally, claims 5, 12, 22 and 29 further recite that the control unit determines the correction factor by dividing the piezoelectric element's normal travel distance by the piezoelectric element's respective actual travel distance. None the Office Action of March 27, 2002, the Final Office Action, and the Examiner's Answer even allege that the combination of Moloney and Takada et al. or Jaenker discloses that the control unit determines the correction factor by dividing the piezoelectric element's normal travel distance by the piezoelectric element's respective actual travel distance, as recited in claims 5, 12, 22 and 29, and it is respectfully submitted that these features of claims 5, 12, 22 and 29 are not disclosed, or even suggested, by the references.

Furthermore, claims 6, 13, 23, and 30 further recite that the control unit determines the correction factor as a

function of temperature. None the Office Action of March 27, 2002, the Final Office Action, and the Examiner's Answer even allege that the combination of Moloney and Takada et al. or Jaenker discloses that the control unit determines the correction factor as a function of temperature, as recited in claims 6, 13, 23, and 30 and it is respectfully submitted that these features of claims 6, 13, 23, and 30 are not disclosed, or even suggested, by the combination of Moloney and Takada et al. or Jaenker.

Claims 7, 14, 24, and 31 depend respectively from claims 5, 12, 22, and 29, and are therefore patentable over the combination of Moloney and Takada et al. or Jaenker for at least the same reasons given above in support of the patentability of claims 5, 12, 22, and 29.

Additionally, claims 7, 14, 24, and 31 further recite the normal travel distance and the respective actual travel distance are measured at substantially the same temperature. None the Office Action of March 27, 2002, the Final Office Action, and the Examiner's Answer even allege that the combination of Moloney and Takada et al. or Jaenker discloses that the normal travel distance and the respective actual travel distance are measured at substantially the same temperature, as recited in claims 7, 14, 24, and 31, and it is respectfully submitted that these features of claims 7, 14, 24, and 31 are not disclosed, or even suggested, by the combination of Moloney and Takada et al. or Jaenker.

In summary, it is respectfully submitted that the combination of Moloney and Takada et al. or Jaenker does not disclose, or even suggest, all of the limitations of claims 3 to 7, 10 to 14, 20 to 24, and 27 to 31. It is, therefore, respectfully submitted that the combination of Moloney and Takada et al. or Jaenker does not render obvious claims 3 to 7, 10 to 14, 20 to 24, and 27 to 31, and it is respectfully requested that the final rejection of these claims be reversed.

**III. Rejection of Claims 15 to 17 and
32 to 34 Under 35 U.S.C. § 103(a)**

Claims 15 to 17 and 32 to 34 stand rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Moloney and Takada et al. or Jaenker and Barron or Estevenon et al. It is respectfully submitted that the rejection should be reversed for the following reasons.

The Examiner's Answer states only that claims 15 to 17 are rejected under 35 U.S.C. § 103(a), and the Examiner's Answer does not address the final rejection of claims 32 to 34.

Claims 15 to 17 depend from claim 10 and ultimately depend from claim 8 and therefore include all of the limitations of claims 8 and 10, and claims 32 to 34 depend from 27 and ultimately depend from claim 25 and therefore include all of the limitations of claims 25 and 27. As more fully set forth above with respect to claims 8, 10, 25, and 27, it is respectfully submitted that the combination of Moloney and Takada et al. or Jaenker does not disclose, or even suggest, all of the limitations of claims 8, 10, 25 and 27.

Therefore, it is respectfully submitted that claims 15 and 17 are patentable over the combination of Moloney and Takada et al. or Jaenker for at least the same reasons given above in with respect to claims 8 and 10, and claims 32 to 34 are patentable over the combination of Moloney and Takada et al. or Jaenker for at least the same reasons given above with respect to claim 25 and 27.

Furthermore, claims 15 and 32 further recite that the correction factor is measured as a part of the manufacturing process. In support of this rejection, the Examiner's Answer states, at page 4:

These claims add that an EEPROM is used to record manufacturing history developed correction factors. Each of Barron and Estevnon [sic] teach using an EEPROM to record the history of each value of an injector system.

Therefore, it is not even alleged that either Barron or Estevenon et al. discloses that the correction factor is measured as a part of the manufacturing process, as recited in claims 15 and 32, and it is respectfully submitted that these features of claims 15 and 32 are not disclosed, or even suggested, by the combination of Moloney and Takada et al. or Jaenker and Barron or Estevenon et al. Claims 16 and 17 depend from claim 15 and therefore include all of the features of claim 15. Claims 33 and 34 depend from claim 32 and therefore include all of the features of claim 32.

In summary, it is respectfully submitted that the combination of Moloney and Takada et al. or Jaenker and Barron or Estevenon et al. does not disclose, or even suggest, all of the limitations of claims 15 to 17 and 32 to 34. It is therefore respectfully submitted that the combination of Moloney and Takada et al. or Jaenker and Barron or Estevenon et al. does not render obvious 15 to 17 and 32 to 34, and it is respectfully requested that the final rejection of these claims be reversed.

IV. Response to Arguments

In the "Response to Argument" section of the Examiner's Answer, it is stated on page 4 that:

Note that even if thickness was not explicitly an issue in Moloney, Moloney inherently provides correction of any factor that would lead to an incorrect travel value (stroke). Thus if a kangaroo kicked the actuator and the serve [sic] adjusted the output stroke to the desired final position, Moloney would have inherently compensated for kangaroo kicks.

The Examiner's Answer appears to be relying on the doctrine of inherency, even though the references fail to describe features recited in the rejected claims, such as compensating for deviations caused by variations in the piezoelectric element's layer thickness or the number of layers. It is noted that the foregoing allegation of inherency was made for the first time during prosecution of

this application in the Examiner's Answer. To the extent the Examiner is relying on the doctrine of inherency, the Examiner must provide a "basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristics necessarily flows from the teachings of the applied art." See M.P.E.P. § 2112; emphasis in original; and see, Ex parte Levy, supra. The required basis in fact and/or reasoning for the contention that "Moloney inherently provides correction of any factor that would lead to an incorrect travel value," has not been provided in the Examiner's Answer, nor any of the Office Actions. The attempt to establish that Moloney inherently compensates for any sort of kangaroo kicks only highlights the fallacy of the contention.

The M.P.E.P. and the case law make clear that simply because a certain result or characteristic may occur in the prior art does not establish the inherency of that result or characteristic. That is, "[i]nherency . . . may not be established by probabilities or possibilities," and "[t]he mere fact that a certain thing may result from a given set of circumstances is not sufficient." In re Robertson, 49 U.S.P.Q.2d 1949, 1951 (Fed. Cir. 1999) (quoting In re Oelrich, 666 F.2d 578, 581, 212 U.S.P.Q. 323, 326 (C.C.P.A. 1981)). The Examiner did not present any basis in fact or technical reasoning to support his reliance on this doctrine. Furthermore, the allegations of inherency that appear on page 5 of the Examiner's Answer are improperly based -- and expressed -- in terms of probabilities or possibilities. It is respectfully submitted that the features alleged to be inherent are not inherent, and that the disclosures of the cited references do not disclose, or even suggest, these features.

As explained above, Moloney states that deviation from correct movement is corrected. However, the claims includes the detail that deviations caused by variations in the piezoelectric element's layer thickness or the number of layers are compensated for. This additional detail is

important because it distinguishes between the types of changes caused by age of the piezoelectric device, from the deviations caused by manufacturing variations. Moloney appears to be describing the former -- that is, changes caused by age of the piezoelectric device -- because there is no inherent correct positioning of a piezoelectric device that is established during its manufacture. It appears that the positioning deviations would arise after the piezoelectric device has been placed in a particular position and operated for a period of time, such that changes in current positioning relative to its initial positioning may be observed.

Therefore, the deviation of correct positioning stated in Moloney is not the same as the deviations caused by variations in the piezoelectric element's layer thickness and/or the number of layers. Accordingly, Moloney does not inherently disclose deviations caused by manufacturing variations and the Moloney system does not account for manufacturing variations, as Moloney does not address manufacturing variations at all.

9. CONCLUSION

For at least the reasons indicated above and those more fully set forth in the Appeal Brief, Appellants respectfully submit that the art of record does not teach or suggest Appellants' invention as recited in the claims of the above-identified application. Accordingly, it is respectfully submitted that the invention recited in the claims of the

present application is new, non-obvious and useful. Reversal of the final rejections of the claims is therefore respectfully requested.

Respectfully submitted,

Dated: February 23, 2004 By:

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